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USATHAMA

U.S. Army Toxic and Hazardous Materials Agency



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Enhanced Preliminary Assessment Report:

Holmdel Army Housing Units
Holmdel Township, New Jersey

November 1989

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prepared for

Commander
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SUMMARY

The Holmdel housing area in Monmouth County, N.J., does not present an imminent or substantial threat to human health or the environment. There is no evidence to suggest that hazardous or toxic constituents have ever been released from this property, and no immediate remedial actions are warranted for the area. Nevertheless, several potential environmental problems have been identified, and further investigation is recommended.

This property was originally developed in conjunction with a Nike missile battery located in Holmdel Township near the town of Crawford Corners. However, no record exists of any wastes associated with the operation and maintenance of the missile and tracking systems having ever been delivered to or managed at this housing property.

Underground heating oil tanks, located at each of the 12 housing units on the property, are of concern. Although there is no documentation of tank failures or suspected leaks, real property records indicate that the tanks are more than 30 years old. No records indicate that they were installed with cathodic protection, protective coatings, or other corrosion-prevention measures. Each of these tanks may be at or near the end of its effective life.

Electrical service at the Holmdel housing area is provided by a local public utility, but the six transformers located on utility poles within the facility are owned and maintained by the U.S. government. These transformers are not routinely inspected for possible leakage, and they have never been tested for possible PCB contamination. Potential contamination of soil and groundwater from PCB leaks or spills associated with these transformers is a concern, although no such spills or leaks were apparent during the site inspection.

The original floor tile used in these housing units is believed to have contained asbestos. In recent years, the old flooring has been systematically replaced whenever a change of tenant occurred, but the possibility exists that some of the original flooring is still present in a few of these units.

The Holmdel housing area is connected to the adjacent former fire-control area of the decommissioned Nike battery by buried potable water lines, and possibly also by buried sanitary sewer lines, although a sewer connection cannot be determined with certainty from existing records. The migration of Nike missile-related wastes along these lines is therefore possible.

Prior to release of this property, the following actions are recommended:

- Remove and replace underground heating oil tanks at all units on the property, sampling soils in all portions of the tank excavations to identify any possible areas of contamination.
- Test the contents of all transformers on-site as well as the soils at the base of the poles for the presence of PCBs; label transformers and remediate problems as required.

- Determine the presence or absence of buried sanitary sewer lines connecting the housing and former fire-control areas; test soil samples taken from along any lines found as well as those taken from along the potable water lines for the presence of Nike-related contaminants.

These recommendations assume that this property will most likely continue to be used for residential housing.

1 INTRODUCTION

In October 1988, Congress passed the Defense Authorization Amendments and Base Closure and Realignment Act, Public Law 100-526. This legislation provided the framework for making decisions about military base closures and realignments. The overall objective of the legislation is to close and realign bases so as to maximize savings without impairing the Army's overall military mission. In December 1988, the Defense Secretary's ad hoc Commission on Base Realignment and Closure issued its final report nominating candidate installations. The Commission's recommendations, subsequently approved by Congress, affect 111 Army installations, of which 81 are to be closed. Among the affected installations are 53 military housing areas, including the Holmdel housing area addressed in this preliminary assessment.¹

Legislative directives require that all base closures and realignments be performed in accordance with applicable provisions of the National Environmental Policy Act (NEPA). As a result, NEPA documentation is being prepared for all properties scheduled to be closed or realigned. The newly formed Base Closure Division of the U.S. Army Toxic and Hazardous Materials Agency is responsible for supervising the preliminary assessment effort for all affected properties. These USATHAMA assessments will subsequently be incorporated into the NEPA documentation being prepared for the properties.

This document is a report of the enhanced preliminary assessment (PA) conducted by Argonne National Laboratory (ANL) at the Army stand-alone housing area in Holmdel Township, N.J.

1.1 AUTHORITY FOR THE PA

The USATHAMA has engaged ANL to support the Base Closure Program by assessing the environmental quality of the installations proposed for closure or realignment. Preliminary assessments are being conducted under the authority of the Defense Department's Installation Restoration Program (IRP); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 91-510, also known as Superfund; the Superfund Amendments and Reauthorization Act of 1986, Public Law 99-499; and the Defense Authorization Amendments and Base Closure and Realignment Act of 1988, Public Law 100-526.

In conducting preliminary assessments, ANL has followed the methodologies and procedures outlined in Phase I of the IRP. Consequently, this PA addresses all documented or suspected incidents of actual or potential release of hazardous or toxic constituents to the environment.

In addition, this PA is "enhanced" to cover topics not normally addressed in a Phase I preliminary assessment. Specifically, this assessment considers and evaluates the following topical areas and issues:

- Status with respect to regulatory compliance,
- Asbestos,
- Polychlorinated biphenyls (PCBs),
- Radon hazards (to be assessed and reported on independently),
- Underground storage tanks,
- Current or potential restraints on facility utilization,
- Environmental issues requiring resolution,
- Health-risk perspectives associated with residential land use, and
- Other environmental concerns that might present impediments to the expeditious "excessing," or transfer and/or release, of federally owned property.

1.2 OBJECTIVES

This enhanced PA is based on existing information from Army housing records of initial property acquisition, initial construction, and major renovations and remodeling performed by local contractors or by the Army Corps of Engineers. The PA effort does not include the generation of new data. The objectives of the PA include:

- Identifying and characterizing all environmentally significant operations (ESOs),
- Identifying property areas or ESOs that may require a site investigation,
- Identifying ESOs or areas of environmental contamination that may require immediate remedial action,
- Identifying other actions that may be necessary to address and resolve all identified environmental problems, and
- Identifying other environmental concerns that may present impediments to the expeditious transfer of this property.

1.3 PROCEDURES

The PA began with a review of Army housing records located at Fort Dix, N.J., during the week of August 7-11, 1989. Additional information was obtained by telephone from the Army Corps of Engineers District Office in New York City on August 11, 1989, and from conversations with personnel from the Directorate of Engineering and Housing (DEH) and the Department of Family Housing, Fort Dix, during the period August 7-10. A site visit was conducted at the Holmdel housing area on August 8, 1989, at which time additional information was obtained through personal observations of the ANL investigator. The interior of unit #204 was examined during the site visit. Photographs were taken of the housing units and surrounding properties as a means of documenting the condition of the housing units and immediate land uses. Site photographs are appended. ANL investigators revisited the property on September 11, 1989, at which time the interiors of all of the units were inspected.

All available information was evaluated with respect to actual or potential releases to air, soil, and surface and ground waters.

2 PROPERTY CHARACTERIZATION

2.1 GENERAL PROPERTY INFORMATION

The Holmdel housing area is located in eastern New Jersey, near the unincorporated village of Crawford Corners, in Holmdel Township, Monmouth County. The property occupies 4 acres² set within surrounding woodland sparsely interspersed with residential areas. Population estimates for Crawford Corners are not available, but the 1980 population of Holmdel Township was 8,447.³ The land adjacent to the housing area originally contained the fire-control area of the old Nike battery. The former fire-control area is upgradient of the housing area. This parcel was declared excess in 1971.² No records or documentation of any environmental problems or any sampling or testing associated with the former fire-control area were found. Current usage of this land is described in Sec. 2.4.

Figures 1 and 2 show the general location of the housing area.²

The housing units were built in 1957.^{2,4} No additional major construction has taken place on the property since that time. The Army Corps of Engineers district office located in New York City is responsible for major renovations or upgrading within the Holmdel housing area.

2.2 DESCRIPTION OF FACILITY

Figure 3 presents the site plan of the Holmdel housing area.²

Housing Units

The Holmdel housing area consists of 12 "Capehart"-style houses, each having three bedrooms, one family unit, with carport and storage room. Capehart is the model name assigned to these houses by the builder, National Homes. The houses are built on concrete slabs.⁴ Water lines and air conditioning ducts are embedded in the foundation slab.

Utilities

Since development of the property, the housing units have been supplied with drinking water from a well located on adjacent property that was once part of the fire-control area for the local Nike battery. Since 1971, when ownership of that property was transferred to the Township of Holmdel, the township has had the responsibility of providing the housing facility with drinking water from the same well.² The property also receives electricity from Holmdel Township, but all telephone poles and the six electrical transformers on site are the responsibility of the Army.⁵ These transformers have never been tested for the presence of PCBs.

Solid waste garbage is collected from the property by a private contractor.

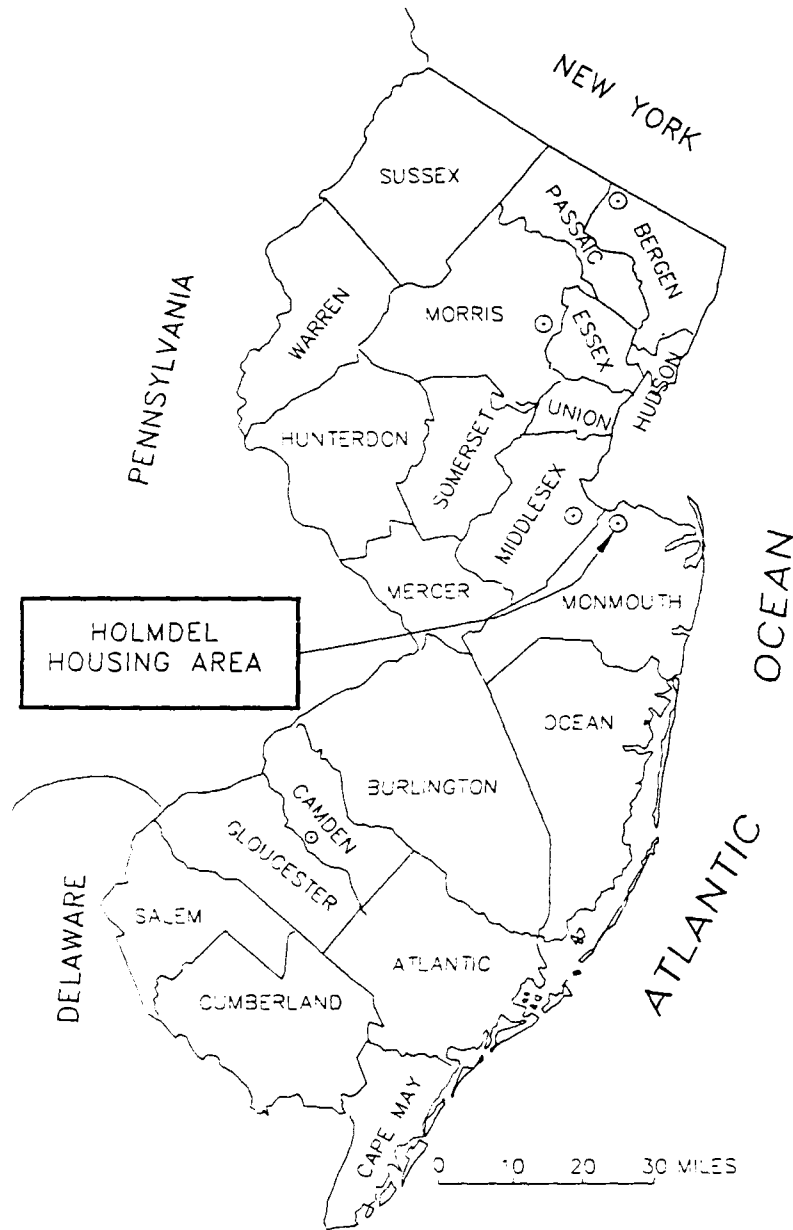


FIGURE 1 Location Map of New Jersey Army Housing Facilities

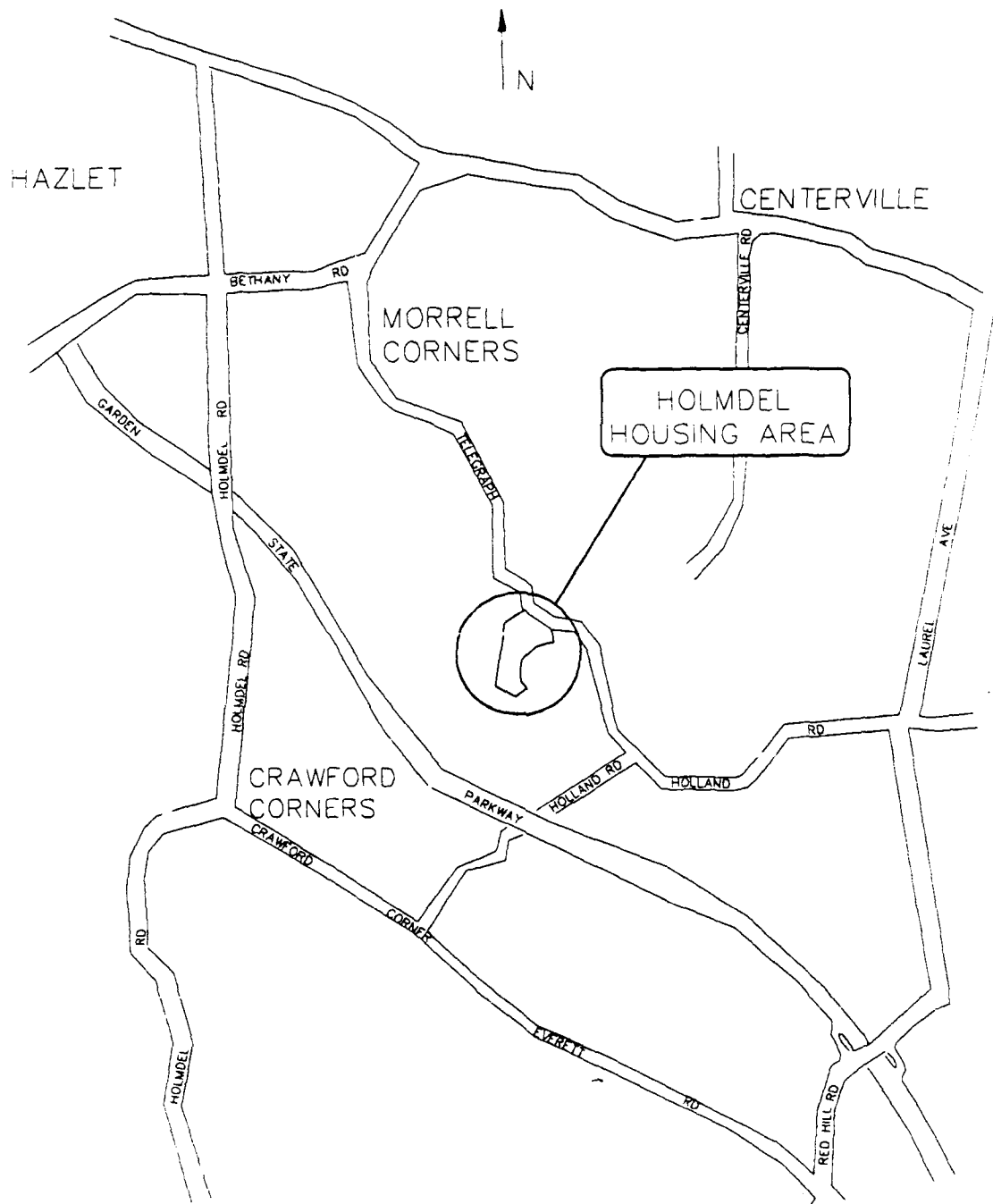


FIGURE 2 Vicinity Map of Holmdel Army Housing Units

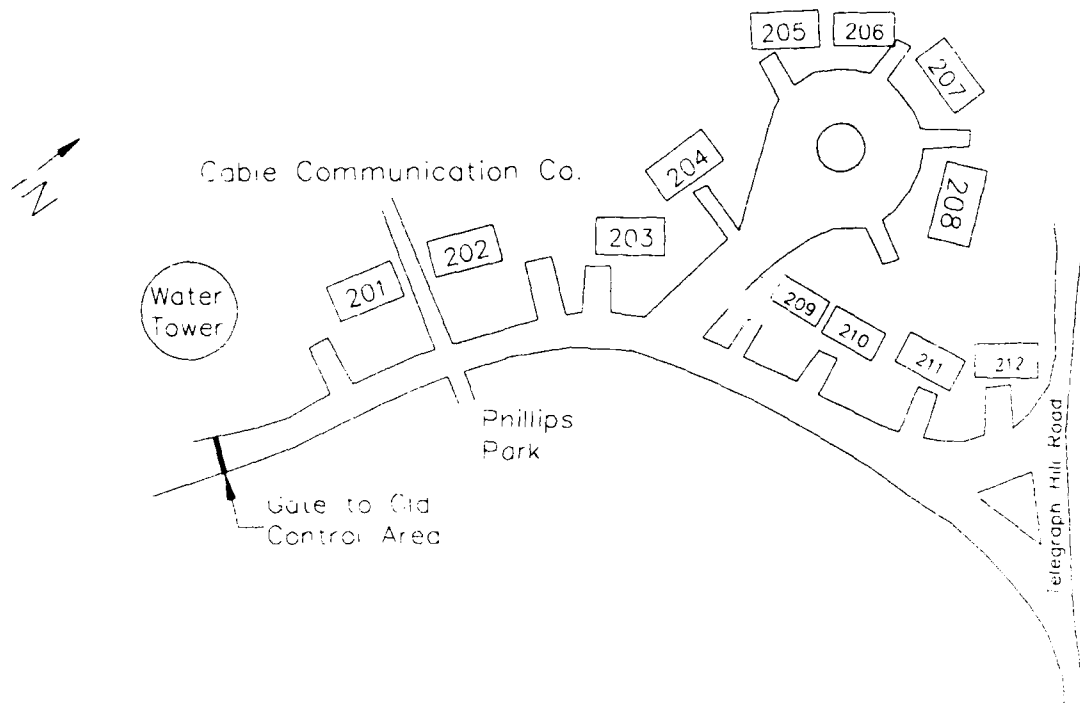


FIGURE 3 Site Plan Map of Holmdel Army Housing Units

Sewage Treatment

According to personnel in the Directorate of Engineering and Housing, Fort Dix, N.J., Holmdel Township has always provided sewage treatment for the Holmdel housing area, and the necessary lines were independent of those servicing the fire-control and launch areas of the Nike missile battery.⁵ This opinion is based on institutional memory; records of utility services to the fire control and launch areas were discarded shortly after these areas were excessed in 1971, and no records have been found to indicate that the U.S. Army ever operated sewage treatment facilities for the Holmdel housing area either on the housing area property or the former control site property. However, according to the Report of Excess,² "utility service is located in the area formerly excessed, and at that time, an agreement was made that any purchaser of the site would supply the housing area with utility service." It is unclear whether this "service" includes sewage treatment or whether the agreement simply provides for an easement for the existing sewer line leading from the housing area.

Fuel Storage

To the rear of each unit is an underground storage tank that holds 550 gallons of fuel oil for heating.⁴ All tanks were installed when the units were built in 1957.⁴ There is no documentation of petroleum releases from any of these tanks. An additional 50-gallon tank to the rear of each unit supplies liquid propane for a gas-fired stove, oven, and water heater. These tanks are also original equipment.⁴

Storm Drainage Systems

The area is drained by open ditches or surface runoff. Drainage flows in a northeasterly direction through a culvert, across Telegraph Hill Road. Stormwater from the rear of units #201 through 206 flows down a steep slope adjacent to the west and northwest property boundary.

Other Permanent Structures or Property Improvements

The housing area contains an external lighting system, utility lines, and paved roads.²

2.3 PROPERTY HISTORY

2.3.1 Nike Defense Program and Typical Battery-Level Practices

Generic information on the national Nike antiaircraft defense program has been compiled in two studies, one commissioned by the Army Corps of Engineers⁶ and the other by the U.S. Army Toxic and Hazardous Materials Agency.⁷ In both studies, independent contractors relied on information contained in unclassified documents related to the Nike surface-to-air missile program, including engineering drawings and specifications (for the facilities and the missiles themselves), interviews with Army personnel participating in the Nike program, and operations manuals and directives relating to the operations and maintenance of Nike facilities. Taken together, these two reports represent the most complete assemblage of generic information on the Nike missile program from an environmental perspective. Salient points from both reports are condensed below.

At its zenith in the early 1960s, the Nike program included 291 batteries located throughout the continental United States. The program was completely phased out by 1976, with many of the properties sold to private concerns or excessed to state or local governments for nominal fees.

Nike Ajax missiles were first deployed in 1954 at installations throughout the continental United States, replacing, or in some cases augmenting, conventional artillery batteries and providing protection from aerial attack for strategic resources and population centers. Typically, Nike batteries were located in rural areas encircling the protected area. The Ajax was a two-stage missile using a solid-fuel booster rocket and a liquid-fuel sustainer motor to deliver a warhead to airborne targets.

The Ajax missile was gradually replaced by the Nike Hercules missile, introduced in 1958. Like the Ajax, the Hercules was a two-stage missile, but it differed from the Ajax in that its second stage was a solid-fuel rather than liquid-fuel power source and its payload often was a nuclear rather than conventional warhead. Ajax-to-Hercules conversions occurred between 1958 and 1961 and required little change in existing Nike battery facilities. A third-generation missile, the Zeus, was phased out during development and consequently was never deployed.

A typical Nike missile battery consisted of two distinct and separate operating units, the launch operations and the integrated fire control (IFC) operations. The two operating areas were separated by distances of less than two miles, with lines of sight between them for communications purposes. A third separate area was also sometimes part of the battery. This area was typically equidistant from the two battery operating sites and contained housing for married personnel assigned to the battery. Occasionally, these housing areas also contained battalion headquarters, which were responsible for a number of Nike batteries.

Depending on area characteristics and convenience, the housing areas were often reliant on the launch or IFC sites for utilities such as potable water, electrical power, and sewage treatment. In those instances, buried utility lines connected the housing area to one or both of the other battery properties. It is also possible, however, that housing areas were completely independent of the missile launcher and tracking operations. In those instances, the necessary utilities were either maintained on the housing site or purchased from the local community. In many localities, as the character of the land area around the housing units changed from rural to suburban or urban, communities extended utility services to the housing unit locations, in which case conversions from independent systems to community systems were made.

A large variety of wastes was associated with the operation and maintenance of Nike missile batteries. Normally encountered wastes included benzene, carbon tetrachloride, chromium and lead (contained in paints and protective coatings), petroleum hydrocarbons, perchloroethylene, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, and trichloroethylene. Because of the rural locations of these batteries, and also because very few regulatory controls existed at that time, most of these wastes were managed "on-site." (Unused rocket propellants and explosives, however, would always have been returned to central supply depots and not disposed of on-site.) It is further conceivable that wastes generated at one of the Nike properties may have been transferred to its companion property for management or disposal.

Wastes related to missile operation and maintenance would not have been purposely transferred from a battery operating area to a housing area with no facilities for waste management or disposal. In some instances, however, the sewage treatment facilities for all Nike battery properties were located at the housing area; that possibility cannot be automatically ignored. Finally, where housing areas received various utilities from either of the operating areas, it is also possible that wastes disposed of on those other properties may have migrated to the housing area via the buried utility lines. And since decommissioning of the Nike batteries did not normally involve removal of buried utility or communication lines, any such contaminant migration is likely to have gone unnoticed.

2.3.2 Holmdel Housing Units

The Holmdel housing units were built in 1957 to provide stand-alone family housing for military personnel assigned to the local Nike battery. Twelve single-family houses were erected on the property.² After decommissioning of the Nike battery in the early 1970s, this area has continued to house active-duty military personnel.

Since the initial property development, no other permanent structures have been added and none of the original structures has been razed. However, renovations have taken place. Kitchen cabinets were replaced in 1965.² Sidings, exterior insulation, gutters, fascia, and splash blocks were installed in 1982, and all exterior trim was repainted.⁸ Windows, roofing, and storage sheds were replaced in 1985.⁵ Flooring in at least several of the units has been replaced during tenant changeovers in past 5 to 10 years.^{5,9}

2.4 ENVIRONMENTAL SETTING AND SURROUNDING LAND USE

The Holmdel housing area is located in a hilly, predominantly wooded area. A sparsely developed residential area lies to the northeast across Telegraph Hill Road. To the southwest, a dirt road leads up a slope to a large water storage tank and a cable communication antenna located on the site of the former Nike fire-control area. A steep, heavily wooded slope lies to the west and northwest of the property; a narrow path leads down the slope to a wider path near a small stream. Phillips Park, a public park completed in 1988, lies along the southeastern boundary of the site. With these exceptions, the land southwest of Telegraph Hill Road, between that road and the Garden State Parkway, is associated with the Garden State Arts Center at Telegraph Hill.

2.5 GEOLOGIC AND HYDROLOGIC SETTINGS^{10,11}

The Holmdel housing area is situated within the Atlantic Coastal Plain Physiographic Province, which is characterized by flat to gently rolling terrain and generally low elevations that decrease gradually in a southeasterly direction. The line of demarcation (fall line) between the Atlantic Coastal Plain and the adjacent Piedmont Physiographic Province bisects New Jersey. This fall line extends in a southwesterly direction from the western end of Raritan Bay and passes through the city of Trenton. The coastal plain, which lies to the southeast of the fall line, is underlain by a wedge of sedimentary rocks that have been deposited during periods of elevated sea level ranging in age from the Cretaceous period (approximately 100-135 million years ago), to the present. The thickness of the sedimentary rocks increases in a southeasterly direction from near zero along the fall line to approximately 6,500 feet near the tip of Cape May in southern New Jersey. Sedimentary deposits near the Holmdel housing area are approximately 600 feet thick.

Sedimentary deposits under the New Jersey coastal plain make up one interrelated aquifer system. The system includes five major aquifers and adjacent confining layers. In the vicinity of the Holmdel housing area, the Farrington (or Raritan) aquifer lies unconformably atop the pre-Cretaceous basement rock; this aquifer is overlain by the Old Bridge (or Magothy) aquifer and the Woodbury Clay and Merchantville formations, which together are about 100 feet thick and form a confining layer. Above these lies the Englishtown aquifer, about 100 feet thick in the Holmdel area. Overlying the Englishtown Formation is a thin confining layer, the Marshalltown Formation (about 15 feet thick); above the latter is the Wenonah-Mt. Laurel aquifer system (approximately 70 feet thick); higher still are the Navesink, Red Bank, and Tinton formations, which

form a porous confining layer just below surficial soils. Except for the surficial soils, these formations are all of the Cretaceous age. Other aquifers of more recent age are important elsewhere in the coastal plain but do not occur in the vicinity of the Holmdel housing area. The well installed in the Holmdel fire control area in 1957 was developed in the Englishtown aquifer, at a depth of 318 feet.¹¹

3 ENVIRONMENTALLY SIGNIFICANT OPERATIONS

3.1 UNDERGROUND FUEL-STORAGE TANKS

Each unit has a 550-gallon underground fuel oil tank buried at the rear. A fill pipe is also located in back of each house. No evidence was observed of staining or other soil discoloration near any of the fill pipes examined. Although no documentation was found to indicate failures or suspected leaks at any of these tanks, real property records show that the tanks are original equipment and therefore more than 30 years old. Also, no indications were found to indicate that any type of corrosion prevention measures were adopted when these tanks were installed. Potential environmental risk results from the continued use of these tanks.

3.2 TRANSFORMERS

The electrical service to the Holmdel housing area is provided by a local public utility, but all on-site transformers are the responsibility of the U.S. Army. No record of any inspection of these transformers for leakage or of any testing of their contents for the presence of PCBs was found. However, no evidence of spills or leaks was observed during the site visit.

3.3 ASBESTOS

The original floor tile used in the Holmdel houses is believed to have contained asbestos.^{5,9} Although the old flooring has been systematically replaced over the past 5 to 10 years, whenever a change of tenant occurs, personnel at the Department of Family Housing, Fort Dix, N.J., indicated that there is a chance that a few units still have the original flooring.⁹ No evidence of the presence of asbestos in the Holmdel units was observed during the site visit by the ANL investigator.

3.4 UTILITY CONNECTIONS WITH FORMER FIRE-CONTROL AREA

Potable water is supplied to the Holmdel housing area from a well located in the adjacent former fire-control area of the decommissioned Nike missile battery. Although the exact location of the well could not be determined, the housing area is supplied with water directly from the large water storage tank on a hill southwest of the housing area. The possibility exists that missile-related contaminants may have migrated along buried water lines from the fire-control area to the housing area.

As indicated earlier, sanitary sewer service in the housing area has been provided by a local public utility since 1957; presumably, that service was also supplied to the adjacent fire-control area while the battery was operational. It is therefore possible that the housing and fire-control areas shared common sanitary sewer lines and connections. If this was the case, the possibility exists that Nike-related contaminants may have migrated along the buried sewer lines.

4 KNOWN AND SUSPECTED RELEASES

No major releases or impacts to the environment are known to have occurred at the Holmdel housing area. No hazardous wastes or hazardous materials are stored on-site.

No documentation of known or suspected releases from the underground fuel-oil storage tanks could be found.

Original floor tiles in the housing units may have contained asbestos. However, most of the floor tiles have been replaced in recent years with nonasbestos substitutes. There is no record of deterioration of asbestos-containing tiles. Some units may still contain their original floor tiles, but it is unclear how many may fall in this category.

5 PRELIMINARY ASSESSMENT CONCLUSIONS

Although these housing units were originally developed to support a Nike missile battery, no missile-related wastes were ever delivered to this property for management or disposal. Buried potable water lines do connect the two areas, and the existence of buried sanitary sewer lines connecting the two areas is likely. Migration of missile-related contaminants along these lines is a possibility. That possibility cannot be fully assessed, however, because of the absence of records showing any details of the utility lines associated with the former adjacent fire-control area.

It is suspected that the original flooring material in these housing units contained asbestos. Although a program for the systematic replacement of the old flooring has been ongoing for several years, original flooring may still exist in a few units. All floor tiles were found to be in good condition, however.

Real property records indicate that the original heating oil tanks installed at each unit are still in service. Assuming an expected lifetime of approximately 20 to 25 years, these tanks should be considered as being at or near the end of their useful life. Furthermore, since there is no evidence that these tanks were installed with any type of corrosion-prevention measures, it can be assumed that the likelihood of leakage from some of them is high. Since integrity testing has never been performed on any of these tanks, conclusive statements regarding releases of stored product from any of them are not possible.

Although electrical service is provided to the Holmdel housing area by a local public utility, the transformers located on-site are the original ones installed when the housing area was built in 1957. The Army has had responsibility for their inspection and maintenance from that time until the present. The possible presence of PCBs in these transformers has not been investigated nor are the transformers routinely inspected for leakage, although no such leakage was apparent at the time of the site visit.

6 RECOMMENDATIONS

Because the original underground heating oil tanks are still in place at this property, and assumed to be near or at the end of their expected useful life, it is recommended that all underground tanks be removed and replaced with new tanks. It is also recommended that soils in all portions of the tank excavations be tested to identify any contamination present.

It is recommended that electrical transformers on-site be inspected for possible leakage. It is also recommended that all existing transformers, as well as the soil at the base of the poles, be tested for the presence of PCBs and that the contents of the transformers be labeled. Any PCB contamination found should be remediated as required.

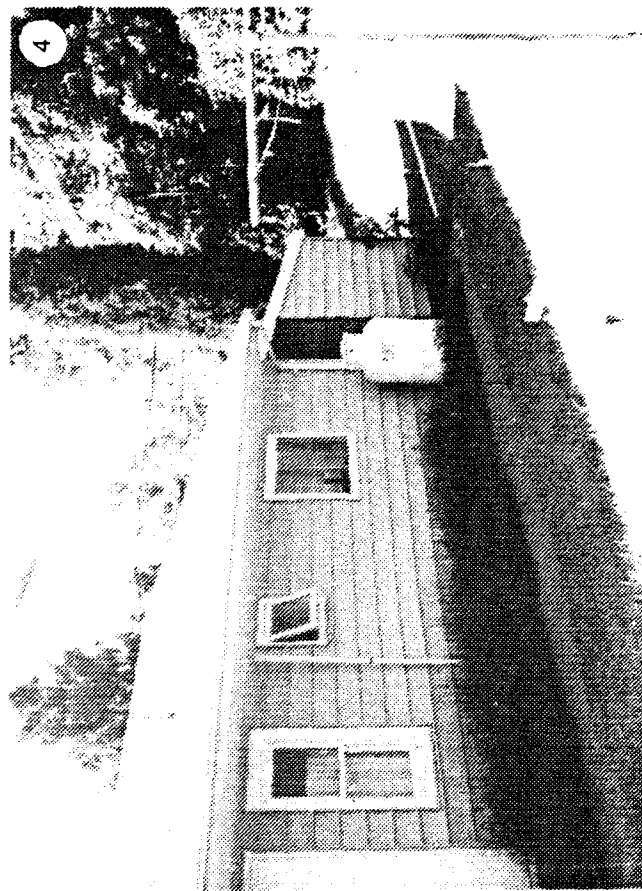
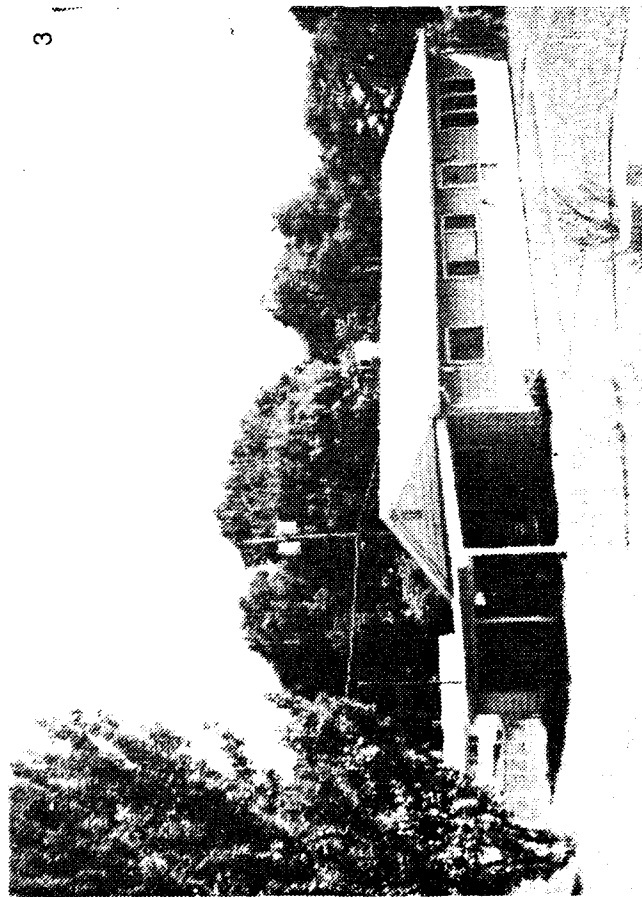
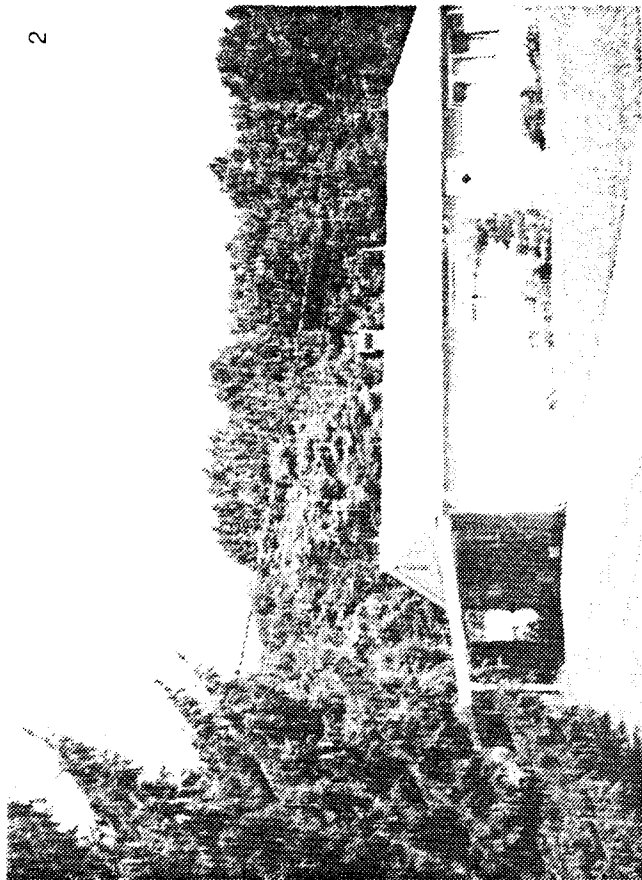
It is recommended that the presence or absence of buried sanitary sewer lines connecting the housing area with the former fire-control area be determined and that soil samples from along such lines as are found to exist be tested for contamination. Soil along the buried potable water lines connecting these two areas should also be tested for the presence of missile-related wastes.

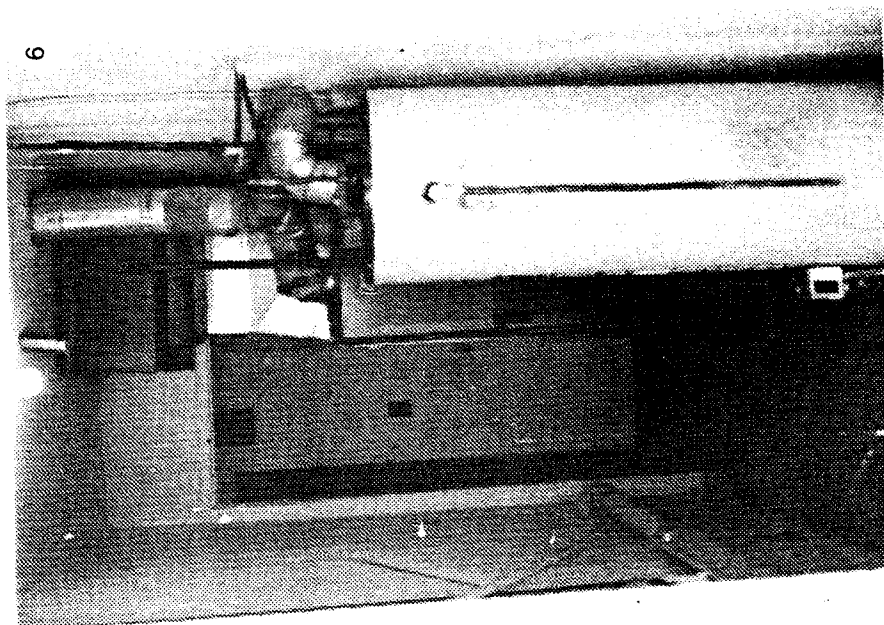
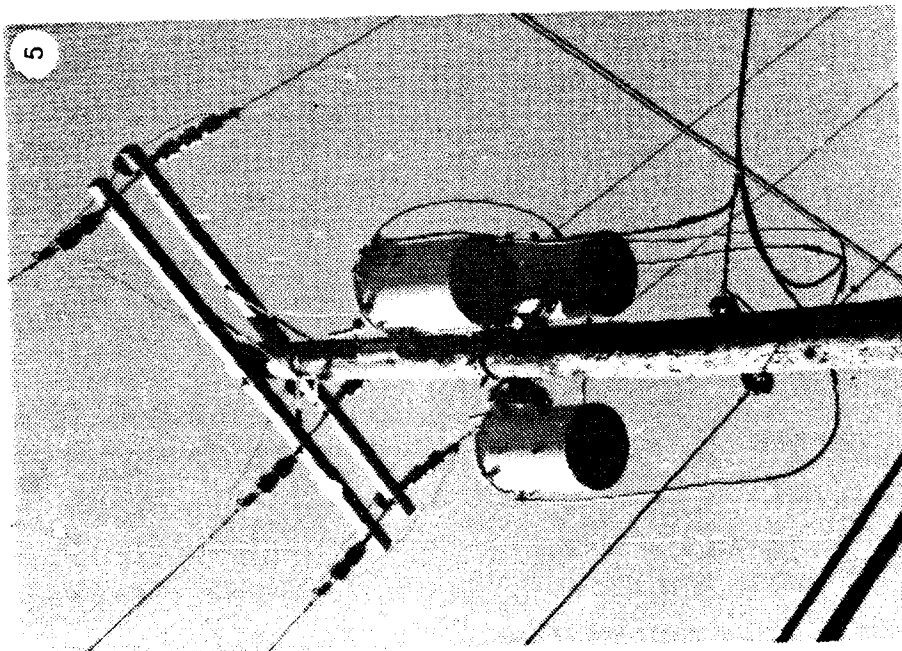
These recommendations assume that this property will most likely continue to be used for residential housing.

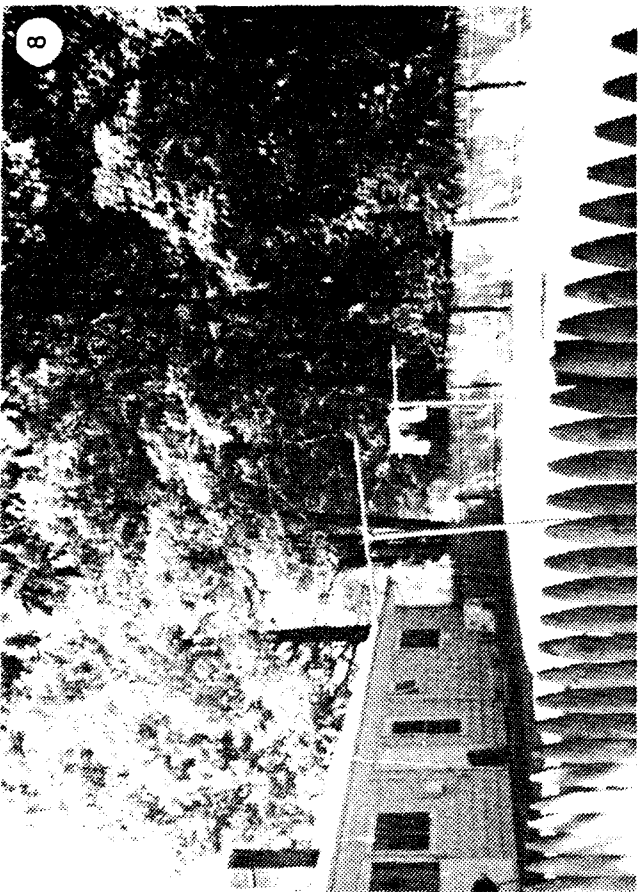
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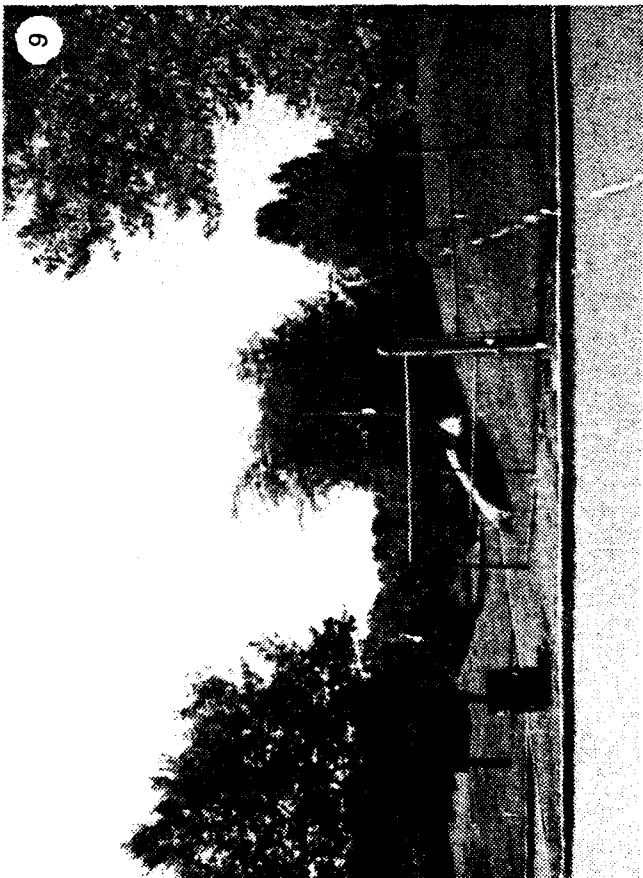
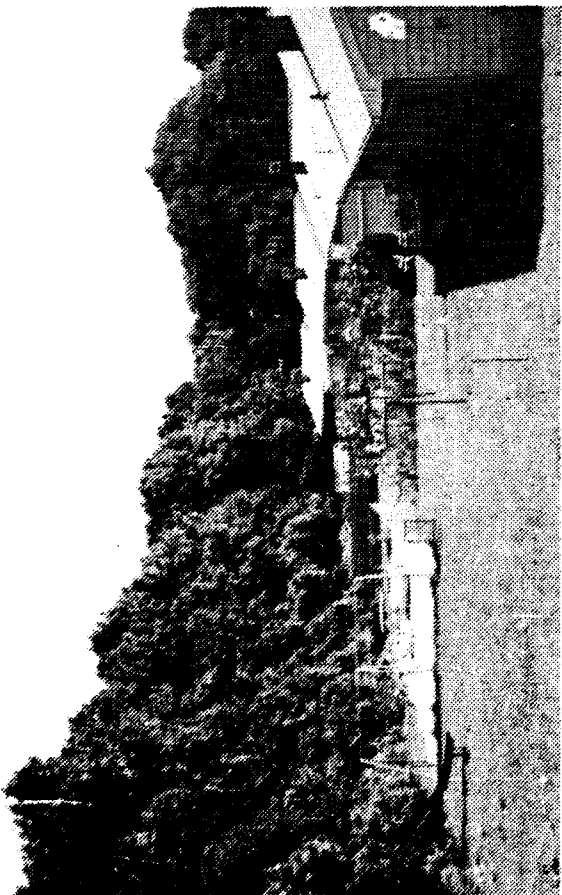
APPENDIX:
PHOTOGRAPHS OF HOLMDEL HOUSING FACILITY
AND SURROUNDING LAND







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IDENTIFICATIONS OF PHOTOGRAPHS

1. View from the entrance to the housing facility; a row of houses and electrical transformers at the top of a utility pole can be seen.
2. One of the 12 Capehart houses; the surrounding area is wooded as can be seen in the background.
3. Another Capehart unit, with electrical transformers at the top of a utility pole behind the house.
4. Rear of a housing unit; the cylindrical white tank contains liquid propane for fuel; the fill pipe for the underground fuel-storage tank (to the left of the clothes line pole at the bottom) also shown.
5. Close-up view of three electrical transformers; on-site transformers are owned by the U.S. government.
6. Furnace room in unit #204; no insulation materials on the pipes.
7. Looking northwest at the rear units #201 to 206; the ground slopes steeply in the wooded area at the left edge of the view.
8. The rear of a housing unit; steep sloping ground starts beyond the fence on the far side of the view.
9. Phillips Park, a public facility, south of the housing area.